FNIRSI-138 PRO Handheld Digital Oscilloscope Manual

FNIRSI-138PRO is a highly practical, cost-effective product launched by FNIRSI.A cost-effective handheld oscilloscope for people in the maintenance industry and R&D education industry,The oscilloscope has a real-time sampling rate of 2.5MS/s and a 200KHz bandwidth.
With full trigger function (single, normal, automatic),Both for periodic analog signals,It can also be used with aperiodic digital signals.Voltages up to ±400V can be measured.Equipped with efficient one-button AUTO,The measured waveform can be displayed without tedious adjustment.The display is equipped with a 2.4-inch high-definition LCD screen with a resolution of 320*240.Built-in 1250mah high-quality lithium battery,A full charge can be used continuously for about 4 hours.



NO.1 Switch Button Introduction

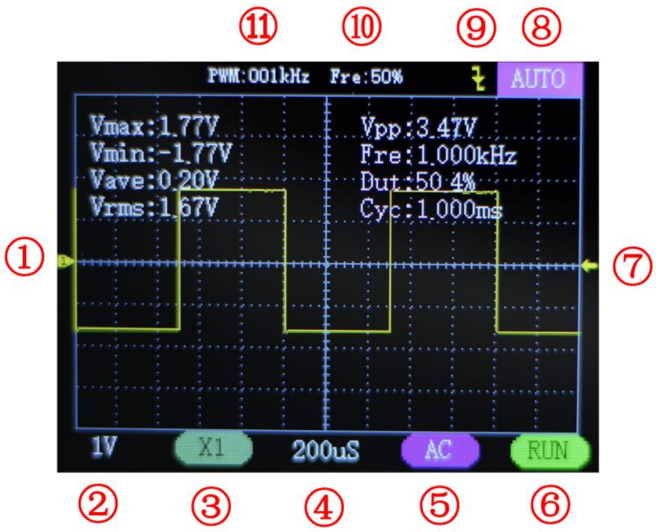


①BNC probe interface
②Reset switch
③Type-c interface
④ON/OFF switch
⑤Function button

Key Description		
Button	**Short press**	**Long press**
SEL	Toggle setting mode	Save key setting parameters
OK	Pause/Start Waveform	在垂直电压档位位置时，长按切换 X1/X10 在其他情况下，长按显示/关闭详细参数
ADD	Move/Change mode	Continuous movement
DIS	Move/Change mode	Continuous movement
AUTO	Automatic adjustment (Frequency below 20Hz cannot be calibrated correctly)	Enter the automatic calibration confirmation interface --> press the OK button to enter the automatic calibration mode (long press AUTO again to cancel)
RST	Reset restart	

NOTE:Built-in oscilloscope without key operation 0.5S to automatically save parameters

NO.2 Display Interface Icon Description



1: Baseline indicator icon : This icon indicates the position that the current position is 0V voltage

2 : Vertical Sensitivity: Indicates the voltage represented by each grid in the vertical direction

3 : 1X/10X mode indicator:1X measure ±40V voltage,10X measures ±400V voltage.

4 : Horizontal time base : Indicates the length of time for each rep in the horizontal direction

5 : Input coupling mode indicator : AC stands for AC coupling,DC stands for direct current coupling

6 : Run/Pause indicator : RUN means run, STOP means pause

7 : Trigger voltage indicator icon

8 : Trigger mode indicator : Auto means automatic trigger,Single means a single trigger,Normal means normal trigger

9 : Trigger edge indicator

10 : PWM square wave signal output duty cycle : The output range is 0-100% adjustable

11 : PWM square wave signal output frequency : output range 1-80KHz adjustable

NO.3 Product Parameters

Product Parameters			
Powered by	Type-C		Lithium battery
Supply voltage	5-6V		4-9V
Capacity	/		1250mA/h
Sampling Rate	2.5MS/s		
Bandwidth	200K		
Voltage range	X1:±40V(Vpp:80V)		X10:±400V(Vpp:800V)
Trigger method	AUTO/Nomal/Single		
Coupling	AC/DC		
PWM output	3.3V	Frequency:0~80kHz	Duty cycle:0~100%
Display	2.4" 320*240		
Size	65*60*18mm		
Weight	53g (Without battery)		72g (With battery)

NOTE:

1: When measuring high voltage, Dont directly touch any metal part of the oscilloscope

2： When using an oscilloscope,

It should be noted that the gear of the probe and the gear of the oscilloscope should be consistent

NO.4　Firmware Upgrade

This instrument currently uses a USB analog U disk for firmware upgrade.
Steps for usage:
ａ、Press the OK button to power on/reset,You can enter the U disk upgrade mode
ｂ、Connect the Typec interface on the board to the computer.At this point, the computer will display a U disk belonging to 138
ｃ、Pull the firmware into the U disk.
Note:Firmware upgrade can only be used when the computer system is WIN10 version

NO.5　Analysis of common problems

1：How can I tell if the battery is fully charged?
A: After the battery is fully charged,The charging light will change from red to green.

2:Why does the waveform jump up and down when testing the signal,Can't see the waveform, just see multiple lines jumping up and down?
A: Set the trigger mode to "Auto" and then press the [AUTO] button once.If the problem is not solved,the clip on the probe may not be grounded,or the probe clip end is open circuit. Please use a multimeter to check whether the probe is normal.

3: Why does the tested waveform shake from side to side,Can't be fixed?
A:Need to adjust the trigger voltage,the yellow arrow on the right.
Press the up and down keys in trigger mode,The trigger voltage can be adjusted.It is necessary to adjust the yellow indicator arrow to be between the upper and lower waveforms,The waveform is triggered.
Also fixed.

4:Why is there no waveform when measuring a battery or other DC voltage?
A: The battery voltage signal is a stable DC signal,There is no curve waveform.In DC coupled mode,Then adjust the vertical sensitivity.There will be an upward or downward offset line waveform.If it is AC coupled，Then there is no waveform no matter how you adjust it.

5:Why when measuring the 220V waveform of the mains,
The VPP peak-to-peak data below is more than 600 V instead of 220V or 310V?
A:Mains 220V is a symmetrical AC signal.Positive peak voltage (MAX) is +310V.Negative peak voltage (MIN) is -310V.So the peak-to-peak VPP below is 620V.The effective value (RMS) is often referred to as the 220V voltage.Mains voltage RMS fluctuates between 180~260V.

So the peak-to-peak VPP is in the range of 507~733V.

6:Why is the measured mains 220V waveform not a very standard sine wave? Distortion occurs

A: The mains power grid is generally polluted,contains more high-order harmonic components.The superposition of these harmonics on the sine wave will give a distorted sine.Generally, the mains waveform is distorted and has nothing to do with the oscilloscope itself.

7:Why is the position of the baseline (0V) and the left arrow (OV indication) different on the screen when there is no signal input, and there is a relatively large offset?

A: Please pull out the probe,unplug the usb cable.Press the [AUTO] button to enter the calibration confirmation interface,Click the [OK] button to enter the automatic calibration